1,135,242

PATENT SPECIFICATION

DRAWINGS ATTACHED

1,135,242

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Date of filing Complete Specification: 19 August, 1966.

Application Date: 13 September, 1965. No. 38941/65

Complete Specification Published: 4 December, 1968.

Index at Acceptance:—H2 A (7E, 7X).

Int. Cl.:—H 02 k 3/48.

COMPLETE SPECIFICATION

Improvements in or relating to Packing Means for Conductors in Stator Slots of Dynamo-Electric Machines

We, ASSOCIATED ELECTRICAL INDUSTRIES LIMITED, a British Company having its registered office at 33 Grosvenor Place, London, S.W.1., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to packing means for conductors in stator slots of dynamo-electric machines, and is particularly suitable for high power generators in which, during normal operation, the stator currents produce radial forces on the conductors within the stator slots.

According to the present invention a dynamo-electric machine stator core has insulated conductors mounted in slots and inflatable packing means arranged in said slots in such manner as, on inflation with a pressurised fluid medium, to exert pressure resiliently against the conductors and/or against non-inflatable packing means acting on the conductors, and so restrict movement of the conductors in said slots.

In this specification the term "radial" means radial with respect to the axis of the stator. Similarly, the term "tangential" means generally parallel to the tangent to the surface of the stator in which the slots are formed.

The use of inflatable packing means makes it possible to achieve the advantages of facility of insertion of the packing means, complete conformity of the packing means with the clearance to be packed and compressive resilience of the packing means to compensate for any shrinkage of conductor insulation after the stator has been completely assembled.

Conveniently, the inflatable packing means consist of inflatable tubes, at least one of which extends axially along each slot. Each tube may be connected to a supply of pressurised fluid medium by means of a common manifold or, alternatively, where the fluid medium is elastically compressible, each tube may be sealed at both ends after inflation. Where two tubes are provided in each slot, one is used to provide a radial force and the other to provide a tangential force, those tubes providing radial forces may be connected to a first common manifold, and those tubes providing tangential forces may be connected to a second common manifold.

If only one inflatable tube is provided in each slot it may on inflation exert either a radial or a tangential force on the adjacent conductors in that slot.

Where a tangential force is supplied to the conductors in each slot, this force may be provided by the inflatable tube which exerts a radial force on at least one wedge shaped packing member fitted between a side wall of the slot and the conductors mounted in the slot. In a further modification a single inflatable tube is provided which exerts a radial force on both the wedge shaped member and on adjacent conductors in that slot.

In a preferred form of the invention, the inflatable packing means are composed of an elastomeric material such as silicone rubber.

The invention will now be described, by way of example, with reference to the accompanying drawings in which Figures 1 to 5 inclusive are part sections and like parts have been assigned like reference numerals.

Referring to Figure 1, there is shown part of a stator 1 in which an inflatable tube 8 is arranged in each of the slots 2 of the stator core so as on inflation to exert a radial force on the conductors 3 in that slot.

[Price 4s. 6d.]

Figure 2 shows a similar arrangement to that shown in Figure 1, but also including side packers 9 comprising inflatable tubes mounted in a complementary recess formed in one side of each slot 2 which, on inflation, exert tangential forces on the conductors 3 mounted in the slots.

Figure 3 shows a modification in which an inflatable tube 10 is arranged in each of the slots 2 of the stator 1 so as to exert a radial force on two oppositely directed wedge shaped members 7 which are mounted in a complementary recess formed in one side of each slot and bear tangentially upon the conductors 3 mounted in the slot.

Figure 4 shows a similar arrangement to that shown in Figure 3, but which also includes the inflatable tube 8 mounted in each slot 2 so as to exert a radial force on the conductors mounted in the slot.

Figure 5 also shows a modification of the Figure 3 arrangement, in which an inflatable tube 11 is arranged to exert a radial force on both the two oppositely directed wedge shaped members 1 and the conductors 3 in the slots 2.

In all the embodiments shown, the conductors 3 have insulated coverings 4. Non-inflatable packing members 6', 6", 6"' are provided between the bottom of the slot and the conductors between the conductors and, where necessary, adjacent the retaining wedge member 5.

Conveniently the inflating medium consists of a viscous and permanently non-setting liquid.

WHAT WE CLAIM IS:—

1. A dynamo-electric machine stator core having insulated conductors mounted in slots and inflatable packing means arranged in said slots in such manner as, on inflation with a pressurised fluid medium, to exert pressure resiliently against the conductors and/or against non-inflatable packing means acting on the conductors, and so restrict movement of the conductors in said slots.

2. A stator core as claimed in claim 1, wherein the slots have retaining members fitted into open sides thereof, whereby to lock the conductors in the slots.

3. A stator core as claimed in claim 1 or claim 2, wherein the inflatable packing means consist of inflatable tubes, at least one of which extends axially along each slot.

4. A stator core as claimed in claim 3, wherein inflatable tubes in different slots are connected to a supply of pressurised fluid medium by means of a common manifold.

5. A stator core as claimed in claim 3 or claim 4, wherein each slot contains at least one inflatable tube which is arranged, on inflation, to exert a radial force on the conductor or conductors in that slot.

6. A stator core as claimed in claim 3, 4 or 5, wherein each slot contains at least one inflatable tube which is arranged, on inflation, to exert a tangential force on the conductor or conductors in that slot.

7. A stator core as claimed in claim 6, wherein the tangential force is provided by means of an inflatable tube which exerts a radial force on at least one wedge shaped packing member fitted between a side wall of the slot and the conductor or conductors mounted in the slot.

8. A stator core as claimed in claim 7, wherein the inflatable tube which exerts a radial force on the wedge shaped member also exerts a radial force on the conductors in the slot.

9. A stator core as claimed in any preceding claim, wherein the inflatable packing means are composed of elastomeric material.

10. A stator core as claimed in Claim 9, wherein the elastomeric material is silicone rubber.

11. A stator core as claimed in any preceding claim, wherein the inflating medium consists of a viscous and non-setting liquid.

12. A dynamo-electric machine stator core substantially as described with reference to Figures 1 to 5 of the accompanying drawings.

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Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd., Berwick-upon-Tweed, 1968.
Published at the Patent Office, 25 Southampton Buildings, London, W.C.2. from which copies may be obtained.

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FIG.1.

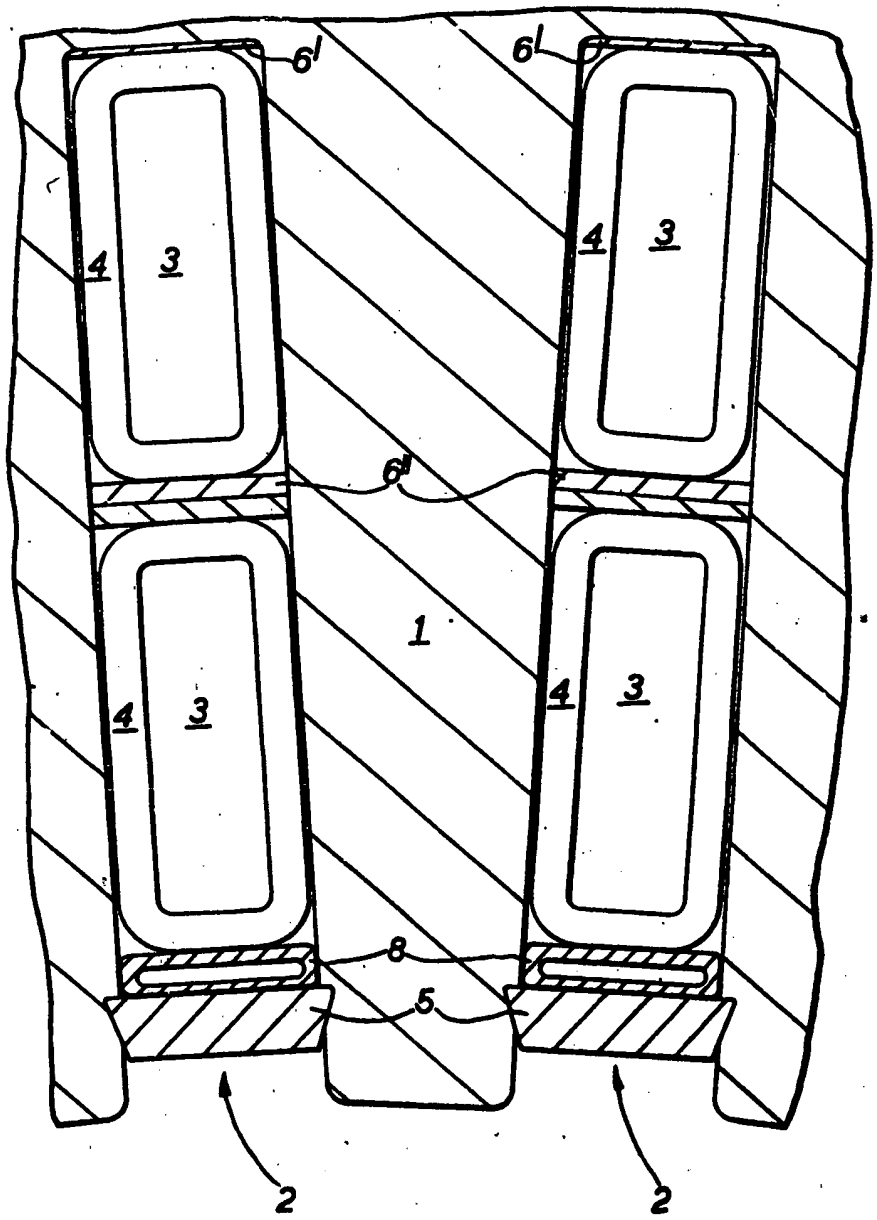
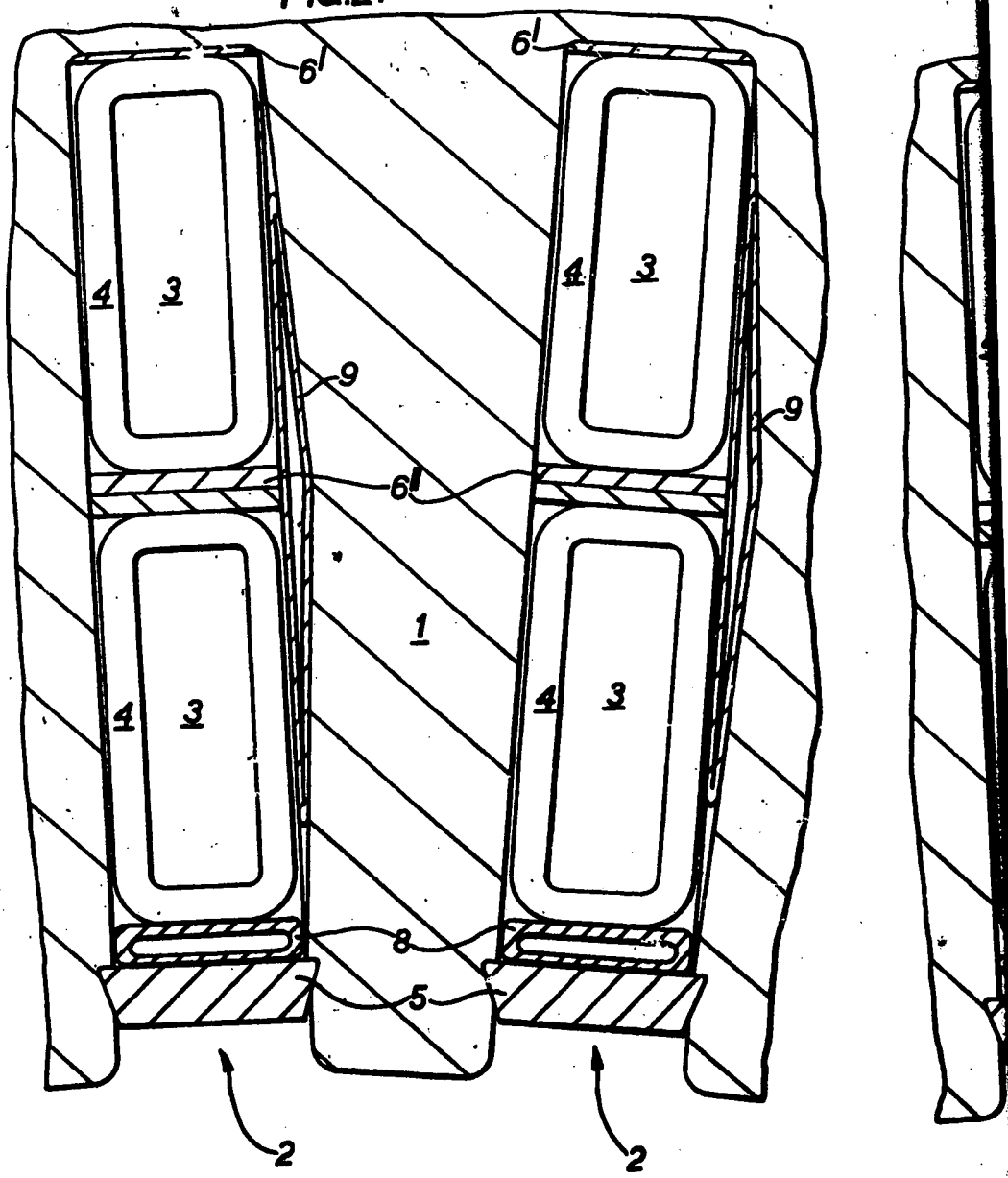


FIG.2.



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SHEETS 2 & 3

FIG.3.

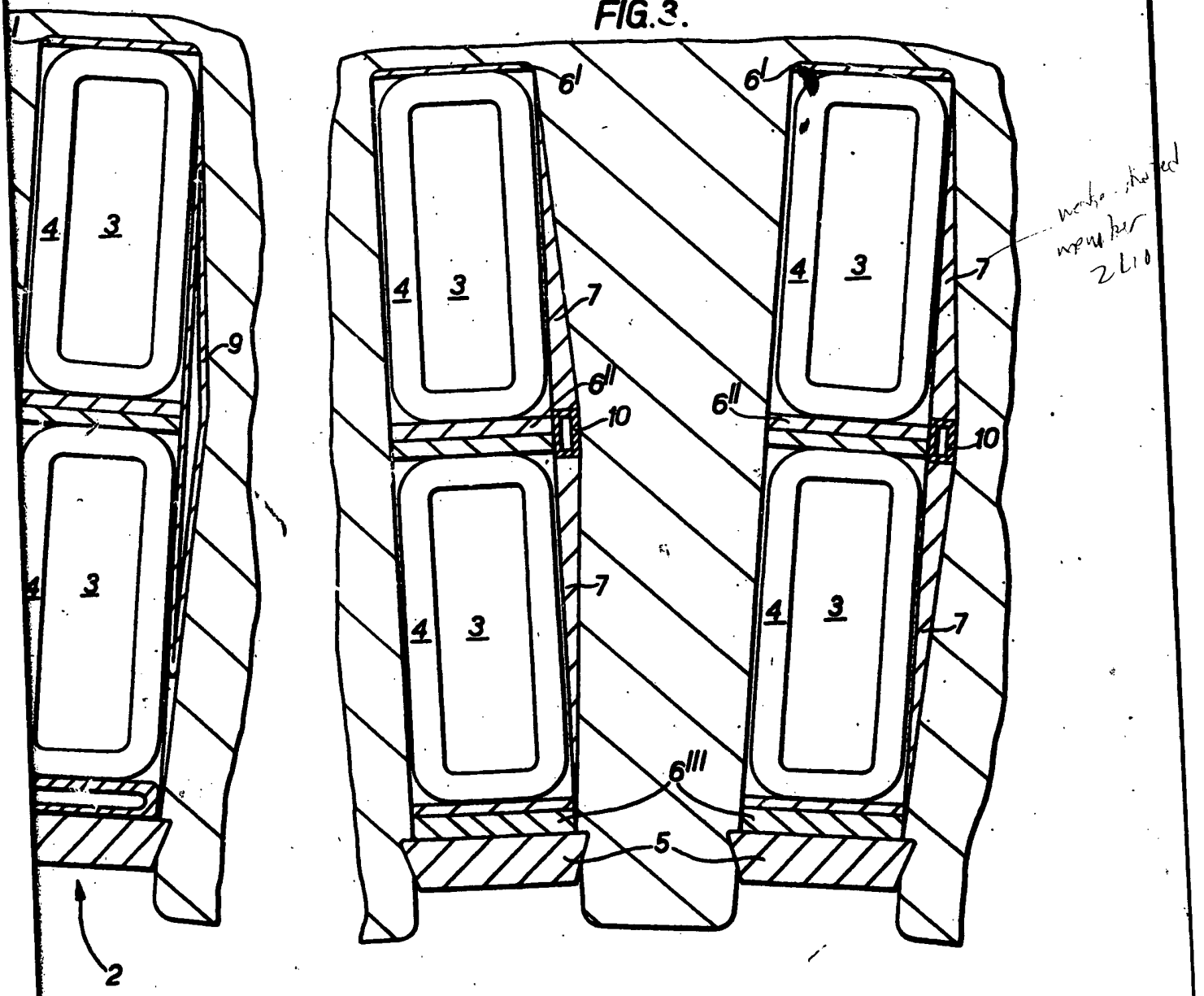
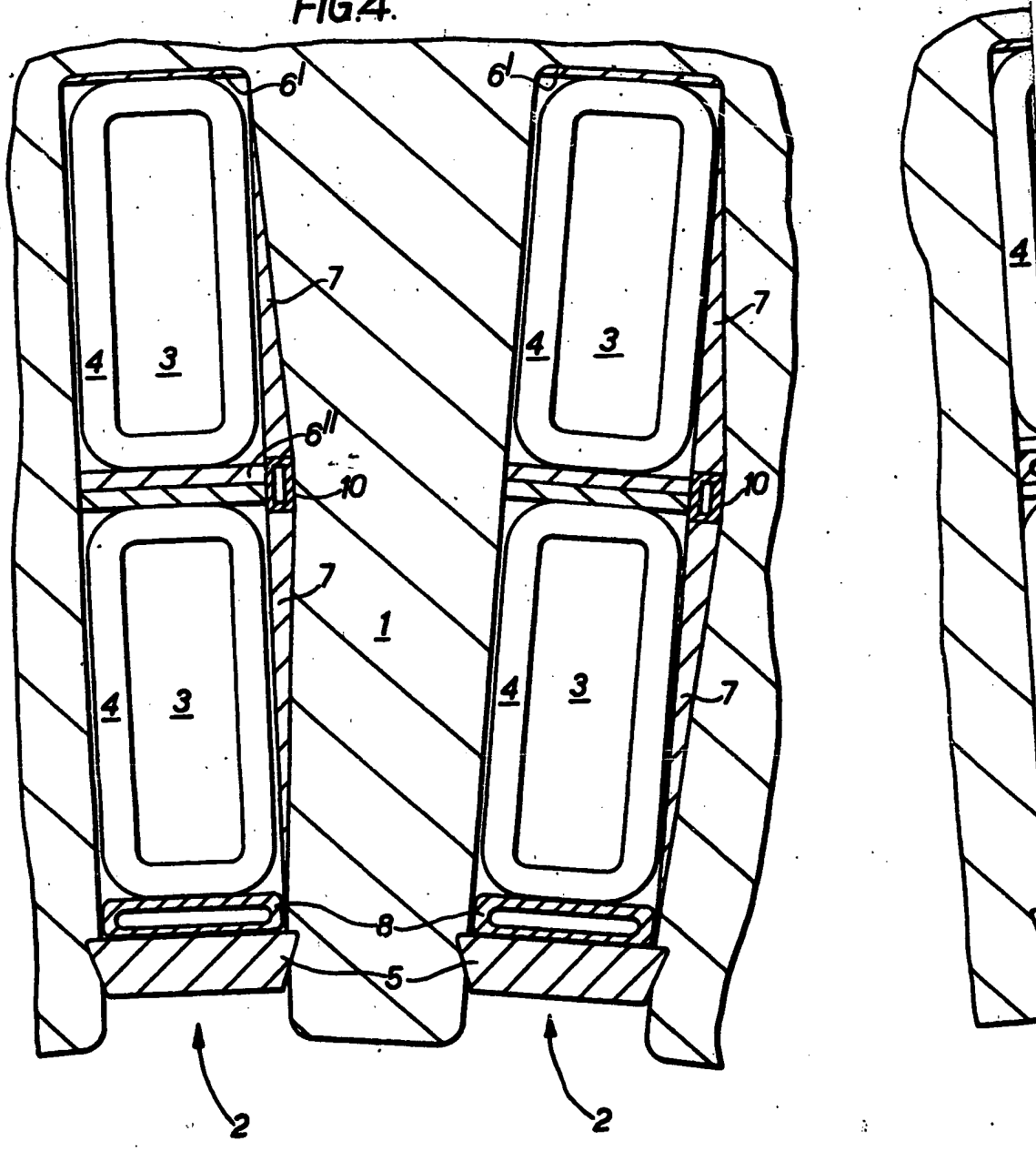


FIG.4.



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SHEETS 4 & 5

FIG.5.